

PDAC IN
THE NEWS

CATCH-UP
WITH LITHIUM

PDAC'S 2023
CONVENTION

LEGACY
MEMBER Q&A

THIS MONTH
IN HISTORY

CORE

THE VOICE OF MINERAL EXPLORATION

WINTER 2023



PDAC 2023 AWARD RECIPIENTS

ANNOUNCING THE PDAC 2023 AWARD RECIPIENTS WITH PROFILES,
PHOTOS, INFO AND A HISTORY OF THE AWARD NAMESAKES

CORE is produced by staff primarily located in Toronto, Ontario, on the traditional territory of the Mississaugas of the Credit First Nation, the Haudenosaunee, the Wendat, also known as the Huron, the Chippewa, the Anishnabeg and all other Indigenous nations that have lived on these sacred lands since time immemorial.

As the voice of mineral exploration and development in Canada, PDAC is committed to reconciliation through respectful dialogue and the creation of meaningful and mutually-beneficial partnerships between First Nations, Inuit and Métis communities and industry.

We respect that as an industry that operates the world over, we engage with organizations and individuals far beyond these lands, and wish to acknowledge all Indigenous lands and peoples across the world, wherever you are reading this from and call home.

CORE

WINTER 2023

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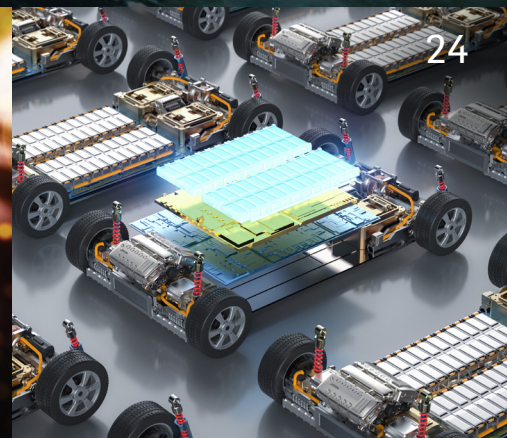
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PDAC IN THE NEWS

WINTER 2023

PDAC'S CONVENTION IS NOW AWARD-WINNING

The Tourism Industry Association of Canada (TIAC) annually recognizes Canadian businesses and organizations that demonstrate leadership and innovation in the tourism industry.

PDAC was awarded the Floor13 Business Event Award for its annual Convention in Toronto.

For 22 years, the TIAC's Canadian Tourism Awards have been open to businesses operating in any tourism-related sector including events, accommodations, transportation, recreation, travel services, and food and beverage. Their criteria for selecting the award recipients involves organizations that exemplify industry best practices, commitment to patron satisfaction, commitment to human resources development and the fostering of a culture that embraces equity, diversity and inclusion.

The gala awards ceremony was held on November 3, 2022. [Click this sentence to read more about our award-winning convention and see what's in store for PDAC 2023.](#)

CANADA'S NEW CRITICAL MINERALS STRATEGY INCLUDES PDAC'S RECOMMENDATIONS

In a public consultation that closed in September of 2022, PDAC offered a series of recommendations to position Canada for success and capitalize on one of the greatest economic opportunities in a generation. The government's Critical Minerals Strategy – announced on December 9, 2022 – recognizes PDAC recommendations on the importance of investing in public geoscience and enabling exploration via targeted financial incentives for critical mineral exploration activities in Canada. This will help identify and assess new deposits, reduce risks for proponents and grow the sector.

"While emphasis on critical minerals may appear rapid, it is something that PDAC and the industry has known for many years, and we are pleased to see it being recognized for the true potential it can offer for Canada – and the world's – transition to a low carbon future," said PDAC's President Alex Christopher.

The Critical Minerals Strategy follows the 2022 federal budget that dedicated \$3.8 billion to the mineral exploration and mining industry, including PDAC's top recommendation to enhance the flow-through share mechanism by doubling the Mineral Exploration Tax Credit (METC) to 30% for critical minerals exploration.

PDAC BOARD MEMBER HONoured WITH TWO DIVERSITY AWARDS

Rosario Astulvica-Rojas, CEO and Founder of Inclusive Mining – who currently serves on PDAC's Indigenous Affairs, Audit, and Governance & Nominating Committees – received two recent awards. The Canadian Hispanic Business Alliance, with the TLN Media Group, honoured Rosario as a "TLN 10 Most Influential Hispanic Canadians" this past December. That distinction was immediately followed by the Association of Latino Professionals for America (ALPFA) recognizing her as one of the "Most Powerful Latinas – Latinas to Watch 2022".

ALPFA was the first Latino professional association in the United States and now holds over 103,000 members, representing 26 professional organizations. Similarly, the Canadian Hispanic Business Alliance promotes entrepreneurship and gives members access to some of most influential leaders in Canada.

Since 2007, Rosario has been a diversity leader and incorporated inclusive practices into the industry both nationally and internationally.

EMBRACING EDI: AN UPDATE ON IMPLEMENTATION

PDAC welcomes and encourages diversity within the association, Board of Directors, staff, standing and strategic committees, suppliers, consultants, contractors, volunteers, members, and attendance at the annual convention.

On October 5, 2020, PDAC released its *Policy on Equity, Diversity and Inclusion*, and in 2021 began the process of implementing this EDI Policy, lead by a Working Group of the Board.

As the leading voice of the industry, PDAC's aim is to foster an environment that elevates the organization's ability to include EDI strategies at every level. "Embracing EDI" will be a monthly internal PDAC newsletter designed to share resources and ideas to help Committee Chairs and Co-Chairs integrate EDI into Committee work, as part of the implementation of the EDI Policy.

To read PDAC's current *Policy on Equity, Diversity and Inclusion*, [click here](#).



PDAC AT THE HOUSE OF COMMONS

On November 22, 2022, PDAC's Executive Director Lisa McDonald, and Jeff Killeen, Director, Policy and Programs, added testimony during the House of Commons Standing Committee on Natural Resources' (RNNR) meeting, titled "Federal Assistance for Various Natural Resources Industries".

DISTURBANCE STUDY SET SET FOR RELEASE IN 2023

PDAC has cooperatively developed a report with the Mining Association of Canada (MAC) to understand the actual disturbance caused by various types of exploration and mining projects on a land claim.

The Disturbance Study – launching later this year – will show through the development and application of evidence-based research that exploration projects have a negligible long-term effect on the environment.

Environmental stewardship is an important priority for the industry, and a PDAC mandate. We must educate and advocate for positive change, which includes the perspectives of the public about mineral exploration activities. The findings of the Disturbance Study will speak to groups concerned about the size and scope of environmental impacts that land claims produce in a detailed and transparent manner.

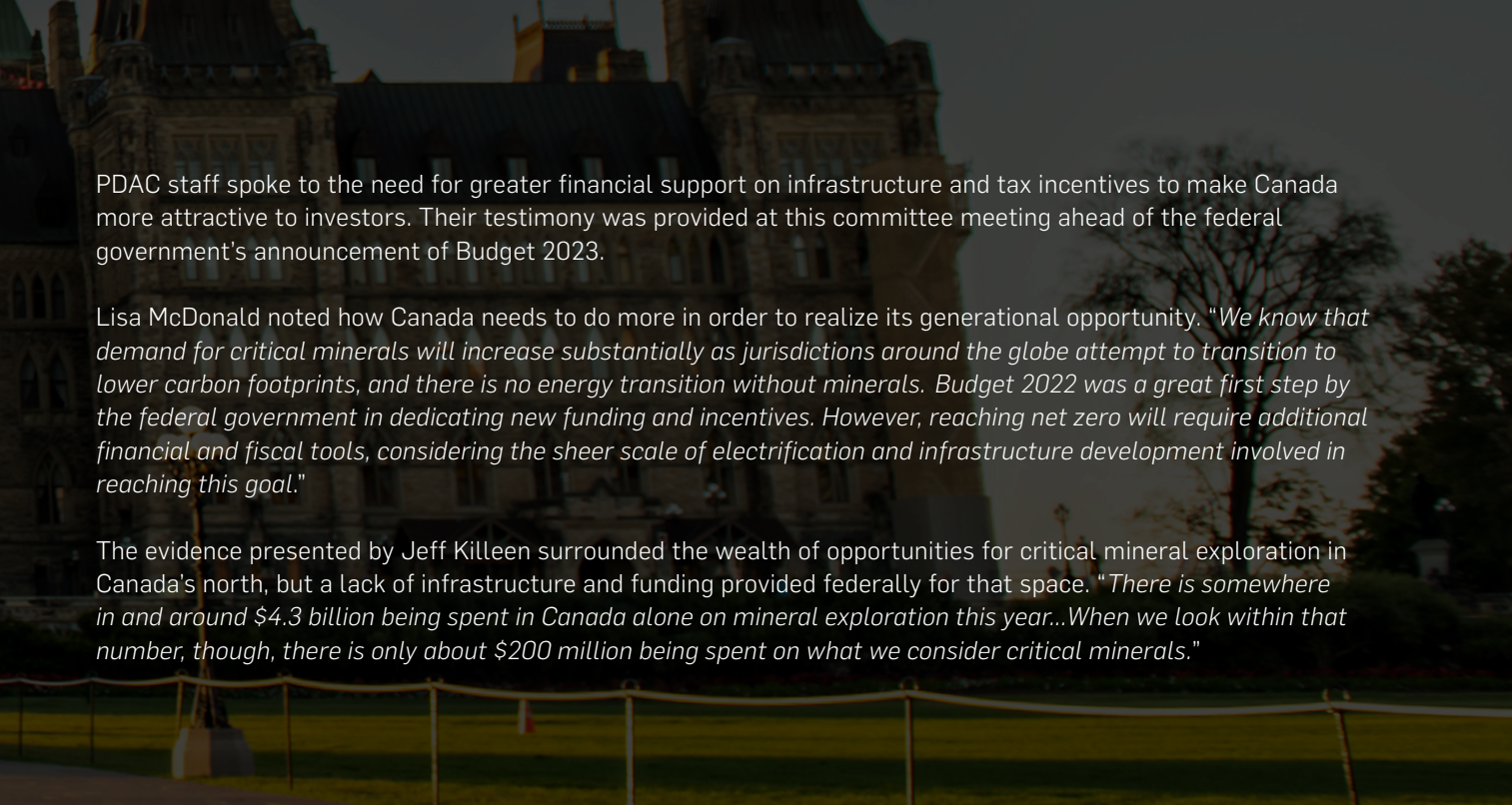
To read more about PDAC's ESG (Environment, Social and Governance) policies, programs and advocacy for sustainability practices, [click here](#).

CHAIR OF PDAC'S INDIGENOUS AFFAIRS COMMITTEE RECEIVES AME AWARD

A diverse group of industry leaders were recognized for their remarkable contributions, achievements, innovation and leadership in the mineral exploration and development industry for the 2022 Association for Mineral Exploration (AME) Awards.

This included PDAC's Indigenous Affairs Committee Chair Lana Eagle, who received the "AME Frank Woodsie Gold Pan Award". For almost 20 years, Lana has been a strong advocate and voice for Indigenous community relations and reconciliation within the industry. Lana is a member of the Whitecap Dakota Nation, and in 2006 became one of the first Indigenous women to chair a mineral exploration company in Canada (Electra Gold Ltd.). Lana previously received PDAC's Skookum Jim Award, and currently sits on the association's Board.

The AME Awards Gala was recently held on Wednesday, January 25, at the Vancouver Convention Centre West.



PDAC staff spoke to the need for greater financial support on infrastructure and tax incentives to make Canada more attractive to investors. Their testimony was provided at this committee meeting ahead of the federal government's announcement of Budget 2023.

Lisa McDonald noted how Canada needs to do more in order to realize its generational opportunity. *"We know that demand for critical minerals will increase substantially as jurisdictions around the globe attempt to transition to lower carbon footprints, and there is no energy transition without minerals. Budget 2022 was a great first step by the federal government in dedicating new funding and incentives. However, reaching net zero will require additional financial and fiscal tools, considering the sheer scale of electrification and infrastructure development involved in reaching this goal."*

The evidence presented by Jeff Killeen surrounded the wealth of opportunities for critical mineral exploration in Canada's north, but a lack of infrastructure and funding provided federally for that space. *"There is somewhere in and around \$4.3 billion being spent in Canada alone on mineral exploration this year...When we look within that number, though, there is only about \$200 million being spent on what we consider critical minerals."*



“Competitiveness in the market, influence in the Canadian economy, engagement as a respected voice, and leadership for socially responsible and safe practices.”

PDAC PLANS AHEAD TO 2027

PDAC is finalizing its new five-year Strategic Plan in 2023, which will outline the association's priorities and goals through to 2027.

Every Strategic Plan the association has created has been the product of PDAC's Board of Directors' series of internal and external stakeholder interviews, numerous workshops, staff and community engagement, plus feedback from thousands of industry members.

The last time PDAC released a Strategic Plan was in 2017, where the goals were updated to include: competitiveness in the market, influence in the Canadian economy, engagement as a respected voice, and leadership for socially responsible and safe practices. Over the last five years, positive progress has been made towards the goals set out in 2017, via involvement in government sessions, increased investor and stakeholder engagement, plus the introduction of more robust environmental and socially responsible policies for members to adopt. The result is movement towards Canada being the top jurisdiction for mineral exploration and development activities, the industry having increased access to a skilled, inclusive and diverse workforce, the fostering of a global mineral industry community, and proactive steps towards mutually beneficial partnerships between the industry and Indigenous communities.

Keep an eye on our website, social feeds and communications for the announcement of the new, 2022-2027 Strategic Plan coming soon!

THE 45TH PDAC AWARDS

HONOURING THE 2023 RECIPIENTS

Since 1977, PDAC Awards have annually recognized and honoured outstanding achievements, accomplishments, and service of individuals and organizations in the Canadian and international mineral exploration and mining industry.

"PDAC Awards can be considered the Golden Globes of mineral exploration and development," said Alex Christopher, PDAC President.

The PDAC Awards Committee is made up of industry leaders who hold a variety of different positions, skills, experiences, and professional networks in the industry. The Committee makes recommendations to PDAC's Board of Directors, who then select the recipients annually.

This year, five awards were given to the year's top international and domestic performers – selected for

their distinctions, contributions and successes in mineral exploration and development.

The five 2023 awards include the Bill Dennis Award, Skookum Jim Award, Sustainability Award, Thayer Lindsley Award and the Viola R. MacMillan Award.

Named in honour of a former PDAC president, the **Bill Dennis Award** is presented to an individual or team of explorationists who has either made a significant mineral discovery in Canada with potential economic viability, or made an important contribution to the Canadian prospecting and/or exploration industry.

The **Skookum Jim Award** is named after the Indigenous leader of the group that discovered the Yukon Klondike goldfields – one of Canada's most important mineral discoveries. Recipients are from a recognized Indigenous group (Métis, Inuit, First Nation) who have demonstrated exceptional achievement in the Canadian mining industry.

Individuals or organizations who demonstrate initiative, leadership and accomplishments in protecting and preserving the natural environment and/or in establishing good community relations during an exploration

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We know that our industry is vital for the social and economic strength of Canada, and by honouring excellence through the PDAC Awards, we can showcase the responsible ways that mineral exploration and mining makes modern life possible today, tomorrow and into the low carbon future we are headed towards.

- Alex Christopher
PDAC President

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program or operation of a mine are honoured with the [Sustainability Award](#).

The [Thayer Lindsley Award](#) honours the memory of Thayer Lindsley, one of the greatest mine finders of all time. The award is presented to an individual or team of explorationists credited with a recent mineral discovery with potential economic viability, anywhere in the world.

The fifth award for 2023 is named in honour of PDAC's longest serving president, and given to an individual or organization demonstrating leadership in management and financing for the exploration and development of mineral resources. This is the [Viola R. MacMillan Award](#).

Congratulations to all of the PDAC 2023 Award Recipients and their accomplishments.

Turn the page to read about this year's recipients – why they were chosen, their discoveries and experiences.

Skookum Jim Award

The 2023 recipient is Glenn Nolan.

As a former chief of the Missanabie Cree First Nation, as PDAC's first Indigenous President, and an executive of Ring of Fire Metals (formerly Noront Resources), Glenn appreciates the challenges exploration companies face as they work towards stronger Indigenous community relations and participation.

Having spent most of his career in the mining sector, Glenn has been a leading advocate for supporting the development of economic opportunities for Indigenous peoples world-wide. He has supported the government of Canada's efforts to bring awareness of mining opportunities to Indigenous people throughout the Americas, and continues to support the Shuar people of Ecuador and Peru to help establish better relations with their government and regional mining sectors.

After dedicating his life's work to meaningful engagement and consultation between industry and Indigenous communities – including countless hours of volunteer work with PDAC – it's Glenn's turn to be recognized by his peers.

He is receiving this award for his leadership in fostering economic opportunities for First Nations on their traditional lands, and for his long history of volunteerism.

DID YOU KNOW?

As one of four major sponsors of the Canadian Mining Hall of Fame (CMHF), PDAC annually submits up to three nominations for consideration.



Glenn Nolan
SKOOKUM
JIM AWARD
RECIPIENT





Chris Taylor and the Great Bear
Resources Exploration Team
BILL DENNIS AWARD RECIPIENT

Bill Dennis Award

The 2023 recipient is Chris Taylor and the Great Bear Resources Exploration Team.

Since 1985, the Dixie project in the Red Lake gold camp of northern Ontario had been explored numerous times. After thirty years, the industry's conclusion was that whatever potential existed there had already been explored.

But Great Bear Resources CEO, Chris Taylor and VP Exploration, Bob Singh, figured there must be more gold. Starting with the Dixie Limb zone, they used historical data to construct a new model of mineralization.

In 2018, the Great Bear team made its first major discovery: the Hinge Zone. Drill intersections, such as 16.4 metres grading 27 grams per tonne gold, caught the industry – and the market's – attention. This allowed the company to raise funds for further exploration, which led to even more discoveries. During 2019, Great Bear Resources found the Bear-Rimini, Yuma, Auro, Yauro, Viggo and Gap zones. Follow-up drilling confirmed these discoveries were part of a larger continuous zone of gold mineralization later called the LP Fault Zone.

Chris and the Great Bear Resources Exploration Team are receiving this award for this discovery of the Dixie gold deposit, which has reinvigorated exploration in the Red Lake camp.

Sustainability Award

The 2023 recipient is the Lundin Foundation.

The Lundin Foundation – part of the Lundin Group which operates in over 20 countries – provides economic opportunities for communities in the region within its mining operations.

In 2021, the Foundation supported 650 small businesses, generating \$42 million in revenues and provided 2,000 well-paying jobs. The Foundation also helped 79 start-ups launch solutions to climate change, attracting \$30 million in third-party funding to bring those solutions to market.

In Ecuador, the Foundation produced a training program for community members to become best-in-class process plant and mine operators at Ecuador's first large-scale underground mine. Through this program, local residents with no previous experience were trained and gainfully employed, bringing home a cumulative \$3.2 million USD in wages. Additionally, the Foundation provided technical and financial support to a local agricultural cooperative. As a result, the cooperative's 180 producers now export products such as coffee, cocoa, yuca and plantains to countries in Europe, North and South America.

The Lundin Foundation is receiving this award for creating an organization funded by mining revenue with the sole purpose of providing lasting benefits for communities surrounding Lundin Group company's operations, and being a model for the industry on how mining can foster a more sustainable future.



Lundin Foundation
SUSTAINABILITY
AWARD RECIPIENT



LUNDIN
FOUNDATION



Kevin Frost & Morgan Fréjabise
THAYER LINDSLEY AWARD RECIPIENTS



Thayer Lindsley Award

The 2023 recipients are Chalice Mining's Kevin Frost & Morgan Fréjabise.

When the Chalice Mining team of Kevin Frost and Morgan Fréjabise studied surveys and regional geoscience datasets, they saw the hallmarks of an ultramafic-mafic intrusive complex hidden beneath an extensive regolith cover close to Perth, Australia. Because of this regolith cover, the region's geology is naturally obscured, so previous explorers ignored the area's potential.

By applying electromagnetics on the ground and multi-element soil geochemistry, they were able to hone in on a rich deposit of metals – now known as the Gonneville deposit. After a relatively shallow drill depth of about 40 metres, the team uncovered one of the most significant nickel sulphide discoveries in recent global history – and the largest PGE discovery ever in Australia.

The Gonneville deposit is significant because of the scale and range of valuable metals it contains at a shallow starting depth, including palladium, platinum, nickel, copper and cobalt – all critical to green technologies. This discovery is also extraordinary given how close the deposit is to Perth (less than 70 kilometres) – the capital of Western Australia – which was already an extensively explored mining jurisdiction.

They are receiving this award for the discovery made under cover, which established a new mineral province along the western edge of the Yilgarn Craton in Australia with over 1,000 kilometres of unexplored potential.

Viola R. MacMillan Award

The 2023 recipient is Alamos Gold's John A. McCluskey

Based on a thorough analysis of geological data, Alamos Gold's President and CEO John McCluskey was confident the Island Gold deposit – owned by Richmond Mines – was larger and richer than the published material suggested.

In September of 2017, Alamos acquired the Island Gold operation, which has since grown dramatically: reserves and resources have almost tripled (from 1.8 million ounces to 5.1 million); the mine life has more than doubled to 18 years at higher production rates; and the exploration potential has expanded through the acquisition of a substantial land package surrounding the mine.

Now, five years after the acquisition, Island Gold is valued at nearly three times its acquisition price. The operation continues to grow through a self-financed expansion that transformed Island Gold into one of the largest and most profitable gold mines in Canada. Additionally, this once underappreciated and misunderstood mine is helping support and sustain local communities in Northern Ontario.

Island Gold may well turn out to be the company's best acquisition reflecting McCluskey's vision, strategy and perseverance. This award is being presented for his leadership and a willingness to take risks in Alamos' acquisitions and developments.



John A. McCluskey
VIOLA R. MACMILLAN
AWARD RECIPIENT





NOMINATIONS
FOR THE PDAC
2024 AWARDS
ARE NOW OPEN
pdac.ca/nominate



This year's recipients
will be celebrated at
a prestigious Awards
Gala during the annual
PDAC Convention in the
Ballroom at Toronto's
Fairmont Royal York hotel.





THE AWARD- WINNING CONVENTION EXPERIENCE

| MARCH 5 TO 8, 2023

After winning the Tourism Industry Association of Canada's 2022 "Floor13 Business Event Award", PDAC is making this year's world's premier mineral exploration and mining showcase bigger and better than ever.

Returning as a fully in-person event, and covering over 600,000 square feet of the Metro Toronto Convention Centre, PDAC 2023 will be one of the largest events in the association's 91-year history.

Since 1932, attendees from across the globe have made their way to Toronto for the best business, investment and networking opportunities. Once again, PDAC will welcome investors, miners, scientists, directors, community leaders, students, politicians and more from over 120 countries. This year's Convention has an exciting roster of engaging speakers and programs that are expected to provide exceptional insight into our industry's future. Along with a full slate of expert panels and workshops, PDAC 2023 will be another industry-leading showcase.

“

The industry is in a period of transformation and growth, and that energy is well captured within the lineup of programming and speakers we have this year.

- Valerie Wilson

Convention Planning Committee Co-chair

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Click here for a comprehensive list of the events and programs for PDAC 2023, or visit pdac.ca/convention/programming





BIGGER & BETTER THAN EVER

For almost a century the mineral exploration and mining community has attended PDAC's annual convention. Headlining the efforts each and every year is PDAC's Convention Planning Committee (CPC).

Valerie Wilson
Convention Planning Committee Co-chair



The CPC is an expert team made of industry professionals and volunteers from the mineral exploration and mining community.

For the 2023 convention, Valerie Wilson – the new Co-Chair of the Committee – was chosen to create an engaging, exciting and informative showcase that is bigger and better than ever before.

We sat down with Valerie to discuss what it was like attending the PDAC Convention early in her career, and how she sees the future of the world's premier mineral exploration and mining showcase.



You've been in the industry for over 15 years. What originally inspired you to work in geology and mining?

I found my way to geology through a love of adventure, travel, and the outdoors. I took an introductory course in geology and found I loved learning about new minerals, their formation, and how they change according to their environment. My early career found me in the field as an exploration geologist, and I couldn't imagine a better job. Resource Geology was a field I entered consciously to be able to better manage a work/life balance with small children while staying true to my interests. I get even more job satisfaction in this role due to the kind of problems I'm able to help people with, as well as the different community members I'm able to learn from and share ideas with from this position.



What are some of the things you're most excited about bringing to the table with your role in the Convention moving forward?

I have been facilitating and organizing technical talks for the mining community for almost 15 years: MinSouth in London (2008-2012), Toronto Geological Discussion Group in Toronto (2012-2023), and PDAC (2019-2023). Through this work I have learned about what kind of content people value. In my experience, sessions (which include practical and helpful messaging relevant to their day jobs) are the best attended and most appreciated. I am encouraging this kind of content as well as supporting opportunities for dialogue between the audience and the speakers, which I think promotes much needed community and idea sharing.



Can you tell us about your initial experiences and impressions with the Convention – what you were (or were not) seeing in terms of inclusion and diversity-focussed programming? What kinds of changes have you seen in programming in those respects from then, to today?

PDAC showcases cutting-edge work by sharing new ideas through our industry leaders and innovators. As the mining community grows to include a more diverse membership, these voices are increasingly given a platform through PDAC so that we can all benefit from the different perspectives and ideas they bring. This much-needed transition in the industry is supported by PDAC in part through curated programming, such as the Mining for Diversity event. For me, this kind of programming is a bridge to capturing these voices within our core programming.



What are some of the things you've enjoyed about the Convention that, for you, are staples that will always be a part of the show?

This is a tricky one. A lot of people attend PDAC for reasons peripheral to the show content: to meet members of the mining community, raise money, and make deals. Although the technical program is a key framework of the Convention, the content that we as the CPC thoughtfully curate is designed to be complimentary to and supportive of these other ambitions, and I think we do a good job of this. I've always enjoyed the way the show works to elevate and celebrate members of the mining community and maintaining this aspect of the show, to me, is a must.



Are there programs that are not part of PDAC 2023, but that you would like to introduce in the future?

We are looking to evolve the way we capture ideas from the larger community and to find more ways to integrate them into the conference. You'll see this at PDAC 2023 – where we are providing an easier and faster way to share your feedback with the show organizers. Stay tuned for even more ways to engage and contribute to the conference content and themes for 2024.

THE IMPORTANCE OF GOVERNMENT PARTICIPATION AT PDAC'S CONVENTION

PDAC has become the single most important venue for dialogue between governments and the mineral and mining sector, and a significant backdrop for a variety of government announcements and initiatives.

Upon entering the Trade Show at PDAC's Convention, one of the first things you are likely to see is the large "Canada" sign hanging from the ceiling high above the Canada Pavilion – the official booth of the Canadian government. A further look around reveals exhibits from other provinces and international governments. This is a sign of the annual event's increasing importance in the geopolitical landscape.

PDAC's Convention is an important event for Canada, in particular for Natural Resources Canada and the Minister of Natural Resources. In 2022, Minister Jonathan Wilkinson took center stage to announce the launch of Canada's *Critical Mineral Strategy Discussion* paper, and the accompanying public consultation. Given the diverse cross-section of industry, government and other interested parties present at the PDAC Convention each year, governments are acutely aware of the reach their messages can receive in addressing attendees directly.

In 2019, then-Minister of Natural Resources Amarjeet Sohi used the same stage to launch the Canadian Minerals and Metals Plan (CMMP) to position Canada as the leading mining nation, and to lay the foundation for lasting success at home and abroad. One year later, at PDAC 2020, Sohi's successor – Minister Seamus O'Regan – announced *Action Plan 2020*, which outlined concrete actions that fall under the six pillars identified in the CMMP.

Long known as the industry's premier mineral exploration and mining event, the PDAC Convention has also become a regular gathering place for political leaders – offering an important opportunity to meet face to face – both publicly and privately. The showcase has welcomed two sitting prime ministers, including The Right Honourable Justin Trudeau in 2019 and 2020, and Stephen Harper in 2014.

A variety of other global leaders and dignitaries also participate each year. This includes national and international prime ministers, premiers, ministers and financial leaders looking for ways to align and enhance their own region's diverse mineral exploration and mining practices. By having a platform at PDAC's Convention – attended by tens of thousands of individuals from over 120 countries – the government has found an effective avenue in ensuring that our industry is acutely aware of the importance they have in Canada.

This is most evident at the annual International Mines Minister's Summit (IMMS), which is entering

its eighth year at PDAC 2023. The IMMS brings together international ministers responsible for mining with representatives from industry and civil society to participate in an open dialogue on issues facing the sector around the globe. It is hosted jointly with the World Economic Forum and the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development. As an important, unique event, the IMMS publishes a summary of their discussions in a report, which is available to read at pdac.ca.

As governments the world over work collectively towards a low-carbon future, Canada has the potential to be the supplier of choice for the critical minerals needed to get us there.

PDAC is looking forward to hearing what the Canadian government has to say this year, and how we can continue to work collaboratively to ensure that Canada remains the top mining jurisdiction in the world.

We are also excited to welcome government representatives from around the world who will be able hear first-hand what their counterparts are planning for the months and years to come.

PRESIDENT'S MESSAGE

PDAC President Alex Christopher writes about leading the association through two years of a pandemic, a successful return to the convention experience, and his hopes for the year to come.





Little did I know what was in store for me as I embarked on my journey to become the 38th President of the Prospectors & Developers Association of Canada.

Who could have imagined the events of the last couple of years: a global pandemic necessitating a virtual convention in 2021, followed by a last-minute change of dates in 2022 to ensure we could host a successful in-person event – in June no less!

Last year we celebrated an amazing 90 years of PDAC representing the industry in Canada. I would like to personally thank all the members for their continued loyalty and support, ensuring that the organization delivers the necessary support to its members, and the convention continues as the world's premier exploration and development event.

When I first attended this convention many years ago, I was young and enthusiastic. But, as a geologist just starting out, I had no idea how much I did not know about this great industry. Now it is humbling to be on the verge of my 36th PDAC Convention – and as President – which is a great honour for me. This will be my final year as president, and I look back with pride on the work PDAC has initiated and completed during my 10 years on the Board of Directors. Through my tenure, I have had the opportunity and pleasure to connect personally to members, corporate sponsors and supporters of the minerals sector and mining industry. I will value these connections for years to come.

Through all this time, PDAC has worked with industry, partners, Indigenous communities, and government on critical issues related to sustainability, land, capital, people, infrastructure and governance. PDAC continues to proactively engage on issues across a broad range of priorities to maintain a healthy and competitive Canadian mineral exploration and development industry that operates responsibly in Canada and around the world.

Today the global mining industry is experiencing unprecedented change. The industry quickly recovered from the challenges faced in 2020: rising commodity prices, equity financings and global exploration activity through 2021 and 2022 has all been through the backdrop of working to support the energy transition needed in the world's race to net zero. This shift requires more mining, not less. Resourcing the energy transition will demand innovation and flexibility in our approach to ensure we can supply the critical minerals and raw materials needed to support this transition sooner, rather than later.

Mining is a high-tech industry with a strong underlying focus on communities, environment, and sustainability. PDAC has – and will continue to – work closely with our partners and stakeholders to provide perspective on how minerals and mining are inextricably linked to the future of this great planet.

I look forward to welcoming everyone to the 91st annual PDAC Convention this March! I enjoy seeing both familiar and fresh faces on the floor. It's a great opportunity for those acquainted with PDAC, but also for new members attending their first convention to connect, learn and develop relationships and partnerships, for today and tomorrow.



- Alex Christopher
PDAC President

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LITHIUM EXPLORERS & DEVELOPERS PLAY CATCH- UP WITH THE EV BATTERY MARKET

BY VIRGINIA HEFFERNAN



A white electric car is shown from the side, with a blue charging cable plugged into its charging port. The car is parked on a dark surface, and the background is a dark, textured wall. The lighting is soft, highlighting the car's body and the charging cable.

"Where are the lithium resource projects? Why build conversion capacity when there is nothing to convert?" asks global lithium expert Joe Lowry in his 2022 year-end podcast.

It's a fair question for policymakers who envision Canada as a key supplier of critical minerals for the growing North American EV battery market. Despite the push to create a streamlined lithium supply chain under Canada's Critical Minerals Strategy – from mine to battery factory to car manufacturer – the initiative is meaningless without the mines to feed it.

Though Canada does not produce lithium, other than from the Tanco mine in Manitoba owned by China's Sinomine Resources, the country has the potential to be a significant producer, just as Australia evolved over the past decade to supply about 43% of the world's lithium demand from hard rock. (Most of the remaining supply comes from brine operations in Argentina and Chile, and mines in China.)

Australian companies such as Sayona Mining (North American Lithium project, Quebec) Galaxy Lithium, a division of Allkem (James Bay project, Quebec) and Green Technology Metals (Seymour project, Ontario) recognize this potential. They are investing in hard rock pegmatite projects boasting high-grade lithium, low impurities and proximity to vehicle battery markets in North America.

"The fact that (the Australians) are now turning their sights on Canada is indicative that the money is going to be there," Lowry told a recent EV battery metals conference sponsored by Bloor Street Capital. "If you go back five years, the biggest issue was that you couldn't get a lithium project financed...let's just see if the permitting process (can) keep up with how fast the Aussies want to move."

| How much lithium does Canada have?

Canada has 2.6 million tonnes of known lithium resources in various deposits, according to the USGS 2021 mineral commodities report, compared to Australia's 6.6 million tonnes. The most advanced projects are the North American Lithium, Whabouchi and Rose pegmatite deposits, all in northwestern Québec.

North American Lithium reached commercial production in 2018 and briefly shipped concentrate to China before declaring bankruptcy. Sayona and U.S.-based Piedmont Lithium acquired the project north of Val d'Or in 2021

and later announced a resource estimate of 102 million tonnes grading 1.06% Li₂O. Piedmont has agreed to deliver approximately 125,000 tonnes of spodumene concentrate to EV manufacturer Tesla beginning in the second half of 2023 through the end of 2025.

Nemaska Lithium produced its first concentrate at the Whabouchi mine in 2017 but suspended production two years later. Whabouchi contains proven and probable reserves of 27.9 million tonnes grading 1.33% Li₂O recoverable by open pit and a smaller underground resource. U.S.-based Livent Corp., a key lithium supplier to General Motors (GM), BMW and Tesla, intends to restart the mine this year in partnership with the Québec government and build a lithium hydroxide refinery in Bécancour, Québec.

The Rose project contains probable reserves of 26.3 million tonnes of ore grading 0.87% Li₂O from 17 separate zones. The deposit was first discovered in the 1930s and exploration and permitting ramped up over the past decade. Owner Critical Elements Lithium plans to have a mine and concentrator running and start constructing a lithium hydroxide plant in 2024.

Lithium pegmatites range from 0.15 to 1.5% lithium, so the Québec trio is relatively high-grade by global standards. With the influx of lithium production expertise from companies such as Piedmont and Livent, they have a much better shot at success than their history would suggest.

What are the host rocks and how do you find them?

The main source of lithium in Canada is LCT (lithium, cesium, tantalum) pegmatite, a granitic rock generally differentiated by its coarse and variable grain size. One of the largest and richest LCT pegmatites, Greenbushes in Australia, is three kilometres long and a few hundred meters wide, but LCT pegmatites tend to be much smaller than this, according to the USGS. The major lithium ore minerals within pegmatite are spodumene, petalite, and lepidolite.

The ore mineral matters to the purity of the final concentrate produced. Within the Tanco deposit and Frontier Lithium's Pak and Spark

deposits in Ontario, for instance, the original mineral was petalite, which – unlike primary spodumene – incorporates minimal iron when it forms. As petalite reverts to an isochemical spodumene-quartz intergrowth upon cooling, the resulting ore has a relatively low concentration of iron, a costly impurity for some applications, according to Peter Vanstone, a rare metals consultant specializing in pegmatites.

Pak has a measured and indicated resource of 9.3 million tonnes grading 2% Li₂O and Spark – less than three kilometres away along trend – contains measured, indicated and inferred resources of 32.5 million tonnes grading 1.4% Li₂O, among the highest grades in North America. When it comes to hard rock lithium deposits, Frontier's President and CEO Trevor Walker says "grade is king" and, to minimize impurities stemming from the host rock, "width is queen."

While many of the LCT pegmatites in Ontario and Québec have been mapped previously by government geoscientists, exploration for these unique rocks is increasing in tandem with rising lithium prices and demand. But because they are not magnetic, pegmatites do not respond well to most geophysical techniques unless they are vertical and manifest as a magnetic low within the country rock. Prospecting for outcropping pegmatites, aerial images and geochemical sampling are more effective tools.

Another potential source of lithium is in brines within Devonian aquifers of Alberta (Leduc) Saskatchewan and as far east as Manitoba (Duperow). The idea is to preferentially filter lithium ion from saltwater extracted from oil wells using Direct Lithium Extraction (DLE) technology. For DLE to be effective, lithium concentrations in the brines must be at least 75 ppm, according to Michelle Boulet Nicolas, Chief Geologist for the Manitoba Geological Survey.

Alberta-based E3 Lithium is hoping to produce lithium from brines by developing DLE technology that recovers 90 per cent of the lithium while reducing impurities by 98 per cent. Its flagship Clearwater project is in the Leduc formation, an ancient reef complex spanning hundreds of square kilometres that oil and gas producers have been tapping into for decades.

Prairie Lithium is taking a similar approach in the Williston Basin of Saskatchewan, an area also known for oil and gas production, with another proprietary

“

Looking through
old well files
is an excellent
and necessary
starting point.

”



lithium extraction process technology. Both companies benefit from the reams of geological data collected from the prolific aquifers over the years.

"Looking through old well files is an excellent and necessary starting point," says Boulet Nicholas. "Oil is not a necessity for brine production, but...there are hundreds of thousands of oil wells that potentially already have infrastructure and tap into underground horizons that can produce brines."

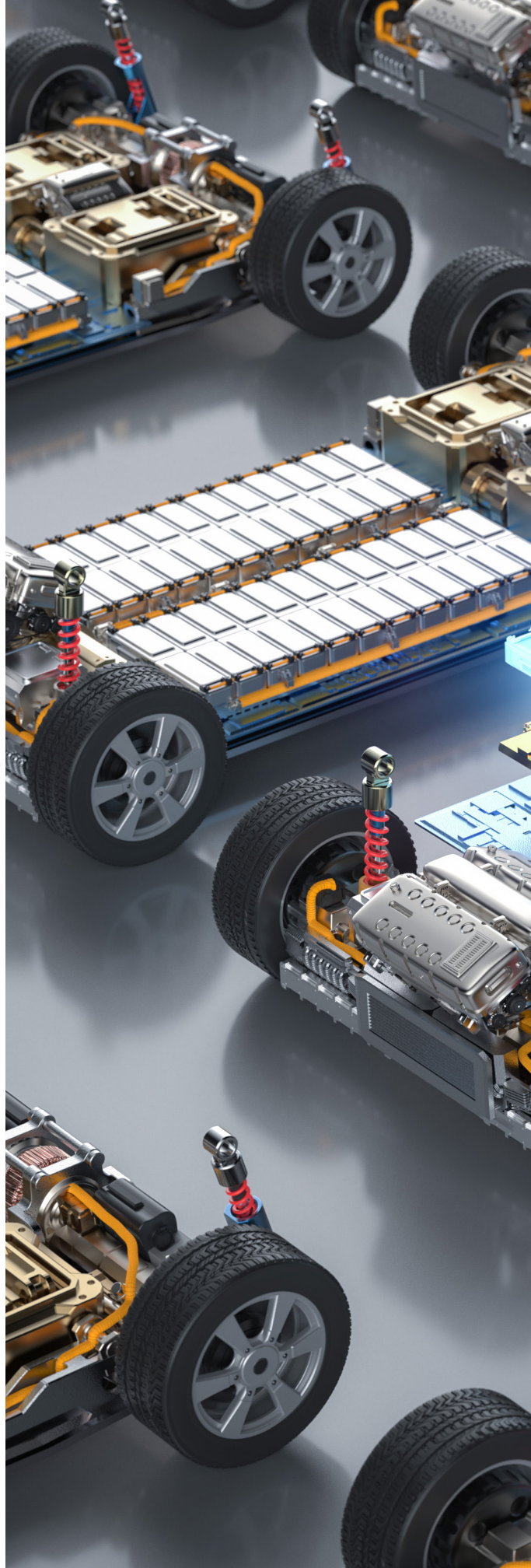
I How does lithium get from mine to battery?

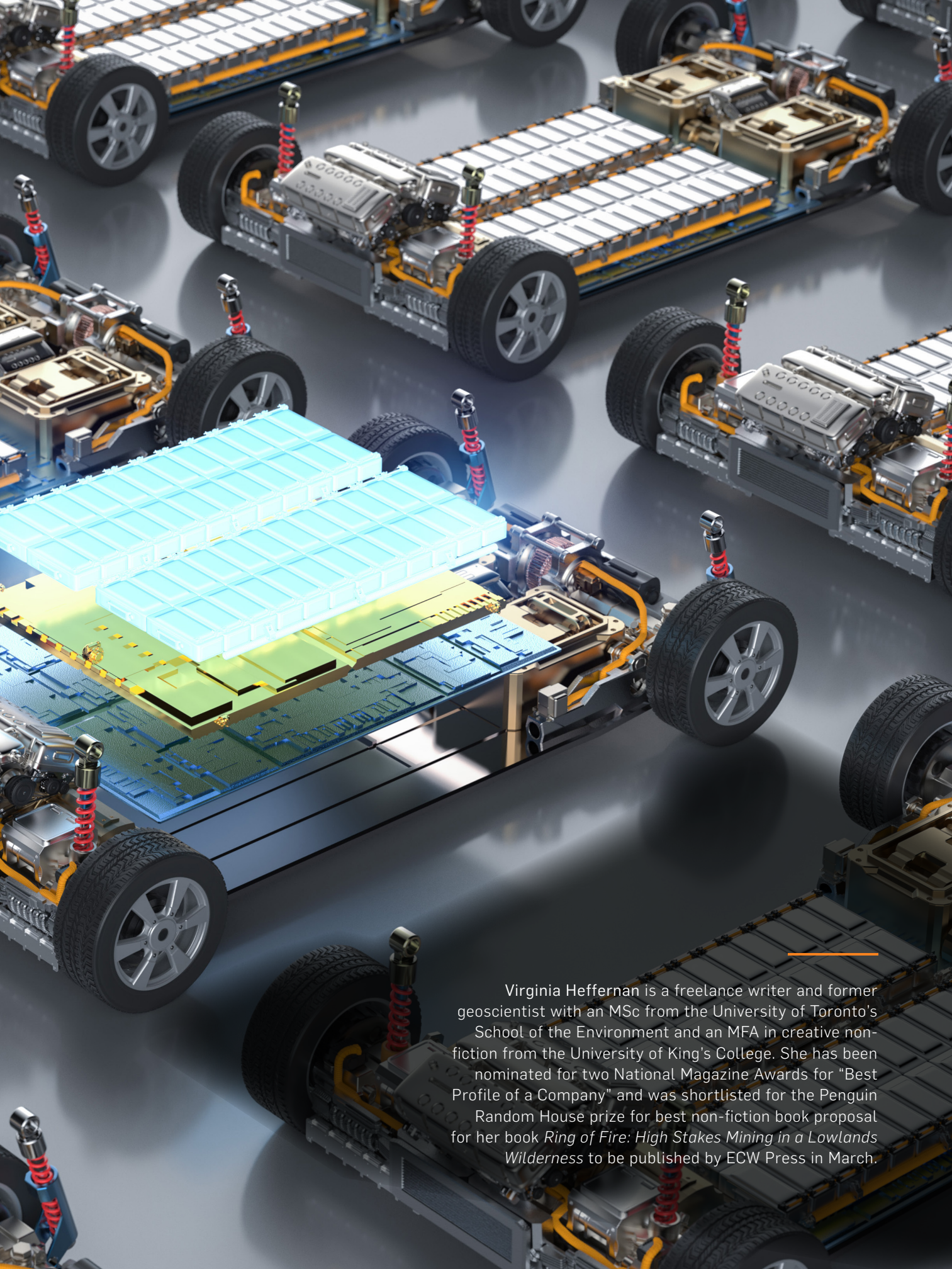
Batteries are expected to account for 95% of lithium demand by 2030, according to McKinsey & Company. To be acceptable to battery markets, a mine must produce a chemical grade spodumene concentrate, a process that can vary in its complexity. The concentrate is then converted to either lithium carbonate or lithium hydroxide in a conversion plant to supply the EV market or other end uses including laptops, cellphones and glass and ceramics.

Lithium hydroxide is now the preferred battery-grade material because the resulting battery cathodes have better storage capacity and longer life cycles. The chemical is then turned into a finished lithium ion batteries in massive production plants, many of which have enough annual output to supply roughly 20,000 Tesla vehicles.

If lithium production from deposits such as Whabouchi proceeds, some of those batteries may soon be produced from Canadian raw materials, creating a homegrown mine-to-EV supply chain. In Ontario, Belgium-based Umicore intends to build an EV battery plant near Kingston while South Korea-based LG Energy Solution and Netherlands-based Stellantis have pledged to build an EV manufacturing facility near Windsor. In Québec, GM has teamed up with South Korea's POSCO Chemicals to invest \$633 million in a cathode materials plant for battery production in Bécancour, Qué, where Livent is planning to build its lithium hydroxide plant.

As auto manufacturers seek to control their own supply chains, *"the mining industry has become part of the auto industry,"* David Paterson, VP of Corporate and Environmental Affairs for GM Canada told the Bloor Street Capital Investment Conference.





Virginia Heffernan is a freelance writer and former geoscientist with an MSc from the University of Toronto's School of the Environment and an MFA in creative non-fiction from the University of King's College. She has been nominated for two National Magazine Awards for "Best Profile of a Company" and was shortlisted for the Penguin Random House prize for best non-fiction book proposal for her book *Ring of Fire: High Stakes Mining in a Lowlands Wilderness* to be published by ECW Press in March.



MEMBERSHIP HAS ITS PRIVILEGES

With 6,500 members, PDAC represents the full range of companies and individuals across the mineral exploration and development community.

Our members include prospectors, geoscientists, environmental consultants, mining executives, students and people working in the drilling, financial, legal and other supporting fields, as well as exploration and junior mining companies, major producing companies and organizations providing services to the industry.

PDAC offers tools, resources, policies and programs for our members to use in improving the industry's environmental stewardship, diversity and inclusion practices, health and safety performance, and sustainable economic growth and prosperity.

Having just launched the new PDAC Member Referral Program, we look back at our longest-running relationships with two of the industry's leading mining companies – Teck Resources Limited and Vale S.A. – who together have more than 60 years of corporate membership in the association.

The following pages include informative and engaging interviews with these legacy members, who give us a first-hand account of how their membership has affected, informed and improved their operations over the years.

Teck

Teck, as a Canadian company, contributes almost \$9 billion to the national economy annually, as well as employing over 8,000 individuals.

Their Sustainability Strategy is one of inclusion and collaboration – especially with Indigenous communities. Their work focuses on providing advanced reconciliation efforts, local benefits and improvements to the well-being of host communities.

As a member for over 30 years, Teck's activities have kept in step with PDAC's advocacy programs and carbon neutral goals – they are currently one of the lowest GHG emission-intensive mining and minerals companies in the world.

PDAC: Your history with us dates back to when Teck and Cominco were separate entities, and were two of the original five PDAC Partners. Tell us about some noteworthy projects/highlights since the early 90s, when Teck became a corporate member.

TECK: The 1990s were a pivotal period for Teck. Following Teck's initial investment in Cominco in 1986 we increased our interest through the 1990s culminating with the merger in 2001. In 1995, Teck made an early investment in junior explorer Diamond Fields, following the first discovery drill holes at Voisey's Bay. Proceeds from this investment ultimately were leveraged into our 22.5% interest in the development of the giant Antamina deposit in Peru.

We leveraged our steelmaking coal assets into the Elk Valley Coal Partnership culminating with the purchase of Fording's interest in 2008 making Teck one of the worlds largest suppliers of seaborne steelmaking coal. In 2007 Teck acquired Aur Resources with the view of unlocking future potential from hypogene sulphide mineralization in the Quebrada Blanca (QB) copper porphyry deposit in Chile. We are now in the process of commissioning and start-up of this operation as the flagship in the rebalancing of our portfolio to become a major global producer of copper, an essential metal for the low-carbon transition.



Teck has participated in our annual Convention for many years. Has Teck made any connections that have benefited the organization in ways that would not have occurred without PDAC involvement?

TECK: We see the PDAC Convention as a key event every year to help ensure that as a company we are plugged in and connected with the broader exploration and mining business. We send a significant delegation to the conference to help keep us informed and connected across all areas of the business, including developments from service providers, academic and research groups, evolving regulatory and ESG environment, and exploration opportunities. Each year our team comes back from the conference with a long list of new project and investment opportunities to investigate.



Are there any specific PDAC programs or policies that the company has adopted and lead to positive change for your operations?

TECK: The e3 and e3 Plus toolkits are key resources that Teck has leveraged in designing our own approach to corporate social responsibility and provide an important benchmark for the industry as a whole. PDAC's role in advocating that mineral exploration is done in a responsible and sustainable manner benefits us all.



Most individuals and companies have a memorable moment at the PDAC Convention. Tell us about one of yours.

TECK: Our reception in the Royal York Hotel has been a highlight of our PDAC participation for more than 20 years, dating back to before the merger with Cominco when we jointly hosted the event. This event has become a staple of the convention, an amazing opportunity to network and reconnect with colleagues. We know that it is the right relationships and partnerships that will lay the foundation for a strong future – and we are pleased that this annual event has become a key part of building and strengthening this foundation.



What industry trends stand out to you as the most consequential?

TECK: It is a very exciting time for our industry as the global population continues to grow while at the same time the world will continue working hard to decarbonize which quite simply can't be done without the critical minerals produced by the mining industry in Canada and beyond.

On a global scale, it's estimated that by 2050, another 2.5 billion people will be living in urban centres. The world cannot meet the needs of a growing population and net-zero climate goals without significantly growing the supply of critical minerals. We have a tremendous opportunity here in Canada to responsibly produce the essential metals and minerals the world needs while at the same time taking action to reduce emissions across our businesses.



Are there any lasting impacts and/or longstanding lessons from the disruptions imposed by the pandemic which you consider particularly important?

TECK: First and foremost, we want to acknowledge that the pandemic represented a huge challenge for millions of people across our industry and in the communities within which we operate, and particularly in less-developed countries these challenges cannot be over-stated. The pandemic showed that in the face of unprecedented disruption we have the capacity to adapt and thrive. Along with many other organizations, at Teck we had to rapidly adopt tools to enable remote work, to ensure we remain connected and productive – tools like video conferencing, cloud-based data solutions and hybrid work structures are the new reality and are here to stay. At Teck we also had the added complexity of building a major new mine with our QB2 project in Chile. While managing through the pandemic was not without its challenges, where we are today points to the resiliency and flexibility of our workforce and instills confidence in meeting future challenges.



Any concluding observations about how the industry has changed (or not) in the decades since Teck joined PDAC?

TECK: The PDAC Convention has changed significantly over the past 30 years, mirroring the changes in the mining industry at large. It has evolved from a small meeting of industry representatives talking about exciting exploration prospects and development opportunities, primarily in Canada, to a more inclusive and diverse group of >25,000 people discussing the full range of opportunities and challenges of our global industry. In particular, the increased focus of social engagement and license to operate, health and safety, development of new talent, new technologies and innovations, and our industry's role in helping combat climate change are just some of the ways in which PDAC has evolved to become the premier global mining industry event.



Vale S.A. operates in over 30 countries, with their global headquarters in Rio de Janeiro, Brazil. Employing approximately 125,000 people worldwide, Vale has also been operating in Canada for over 100 years (their Canadian operations were previously under the International Nickel Company, Inco, purchased by Vale in 2006).

Their Vale Base Metals arm in Toronto is one of the world's largest producers of responsibly-sourced nickel, copper, cobalt and platinum group metals. These contribute to their global production of critical minerals that power electric vehicles and create renewable energy solutions.

Also a PDAC member for over 30 years, Vale has used the association's available tools and resources to help align their practices with the association's priorities of environmental stewardship and inclusion.



PDAC: Your history with PDAC dates back to when Inco was a member. Tell us about some noteworthy projects since Vale adopted the membership in 2006.

VALE: Vale is proud to be a long-standing member of PDAC. Over the past 16 years, we have had many exciting projects and highlights from our Base Metals business, including the inauguration of the Totten Mine in 2014 – Vale's first new mine in Sudbury in more than 40 years, as well as the 2014 commissioning of our Long Harbour hydrometallurgical plant in Newfoundland – the first of its kind. Also in Sudbury, in October, 2022 we celebrated the C\$945 million Copper Cliff Complex South Mine

Project. In 2018 Vale completed the \$1 billion Clean AER (Atmospheric Emissions Reduction) Project, which effectively reduced SO₂ emissions from the Copper Cliff Smelter by 85% and metal particular emissions by 40%. Globally, Vale is advancing US\$8.6 billion in growth projects with our partners in Indonesia, and in Brazil we've made a US\$555 million investment to our Onca Puma nickel operations. Back in Canada, Vale is carrying out its most extensive exploration program in the history of Manitoba – over US\$236 million over the next five years.



Vale has participated in the PDAC Convention for many years. Has Vale made any connections that have benefited the organization in ways that would not have occurred had they not been involved with PDAC?

VALE: PDAC's Convention is a perfect venue to discuss how to grow and transform our industry – by connecting with other mining companies, service providers, junior explorers, the investment community, academics, and leading experts on technical and non-technical matters. Generally, the interactions at PDAC's annual Convention with leading mining service providers who introduce new technologies and efficiencies for our business has proven to be invaluable for Vale.

PDAC also provides valuable opportunities for interactions with governments and Indigenous rightsholder groups. We are committed to building and maintaining strategic partnerships to unlock the next generation of sustainable mining projects. And we strive to be the strategic partner of choice for communities where we operate generating socio-economic benefits for generations to come.



Are there any specific PDAC programs or policies that the company has adopted and lead to positive change for your operations?

VALE: There are so many great PDAC programs that align with Vale's values, such as the Indigenous Program in which Vale participated

and contributed to in 2022. In Canada there are more than 1.6 million people that identify as Indigenous. In Voisey's Bay, we've had Impact and Benefits Agreements in place since we began operations, and they have served as models globally. In 2021, Vale spent \$680 million in purchases and contracts from Inuit and Innu-led companies in Voisey's Bay. We continue to have discussions with our Indigenous partners about the ongoing implementation of these agreements as well as future opportunities for collaboration.



Most individuals and companies have a memorable moment at the PDAC Convention. Tell us about one of yours.

VALE: During PDAC 2020, Vale/PT Sumbawa Timur Mining first revealed the discovery of the Onto Deposit – which is considered world-class and one of the most significant Cu-Au discoveries of the last decade. Another moment was during PDAC 2022, when we safely reconnected with people at our booth after 2 years of challenges related to the global pandemic. This was a great turnout for Vale and provided ample opportunities for networking with other industry experts, government stakeholders, rightsholders and mining industry service providers.



What industry trends stand out to you as the most consequential?

VALE: The increased focus on diversity and inclusion, creating a new generation of miners, geotechnical experts, geologists, skilled tradespeople – together with decarbonization – are some of the most topical and consequential industry trends in recent times. We see a bright future for nickel with demand set to massively increase this decade on the back of the energy transition, led by rapidly expanding sales in EVs. Increasing EV demand – combined with

regionalization of supply chains, higher ESG standards and lower carbon footprint – will require significant investment to bring this new supply. We're seeing governments issue critical mineral policies to work with industry to accelerate supply response. This includes Canada, the United States and Australia. The rise of EV sales and the evolution of the supply chain is providing a greater certainty for additional nickel, copper and PGM demand, and subsequent upstream investments. Vale is uniquely positioned to deliver into this market with the right assets in the right jurisdictions, with expertise, scale, a global flow sheet and a varied product mix.



Are there any lasting impacts and/or longstanding lessons from the disruptions imposed by the pandemic which you consider particularly important?

VALE: Many industry professionals and their families were significantly impacted by the pandemic. The pandemic also had devastating impacts on the economy, and mining was no different. Faced with great challenges, the industry really responded with innovative and resilient methods, including new ways of safely performing key tasks to keep the industry – and the world – supplied with the critical minerals it requires. The pandemic also forced companies such as Vale to accelerate its transformation towards a more collaborative approach truly working as a fully integrated global company.



Any concluding observations about how the industry has changed (or not) in the decades since Vale joined PDAC?

VALE: Some of the most important changes observed are a sustained focus on ESG, the immense value of having a diverse and inclusive workforce, technology, and waste-to-value initiatives. These key initiatives will continue to play a major factor for our company – and the industry – for years to come.

PDAC has remained the leading voice of Canada's mineral exploration and development community since 1932. We undertake advocacy on behalf of Canada's mineral sector, so that our 6,500+ members can focus on achieving success in this globally competitive industry.



MEMBER REFERRAL PROGRAM

We are always keen to welcome new members to our PDAC community! A growing and engaged membership is critical to the association's success and we are pleased to introduce our New Member Referral Program.

🔍 Visit pdac.ca/referral for details on how you can earn rewards for referring a new member.

THIS MONTH IN MINING HISTORY

THE FEBRUARY 1851 AUSTRALIAN GOLD RUSH

40 years before the Klondike gold rush, over 500,000 “diggers” came to Australia from across the globe, starting one of the world’s largest gold rushes.

It was also the catalyst that changed the Australian population’s national identity.

On February 12, 1851, a prospector named Edward Hargraves began panning for gold near Lews Pond Creek in Bathurst, New South Wales. Having travelled to California years before, he brought back his experiences and knowledge to try his luck at home in Australia. As luck would have it, on that day he found gold.

With just a few flakes in-hand, Edward went to the government to confirm his discovery. Even though the find was not publicly announced until May 14 of that year, word had gotten out. Hundreds of diggers had already arrived in New South Wales by the time May’s announcement was made. Australia’s gold rush had begun.

This was not the first time gold was found in Australia. 10 years earlier, Reverend William Branwhite Clarke (who was also a geologist) discovered gold in Australia’s Blue Mountains in 1941. After approaching the government with his find, the then-British colonial authorities suppressed news of the discovery. They feared the current labour force – who had for years been trying to organize for better working conditions nationally – would leave their jobs to prospect for gold. A rush of that size would leave massive vacancies in needed markets, destabilizing the economy.



10 years later, with Edward's discovery in 1951, Australia's gold rush did in fact change the working class system.

In just a few short years, an estimated 500,000 people were prospecting in the newly discovered gold fields. Most of these new prospectors immigrated from Britain, as well as America, Germany, Poland and China.

During that time a large influx of workers from all over Australia also came to Victoria and New South Wales for gold. With such a large mix of individuals having immigrated from across the globe, Australia's population demographic began changing – from the previous majority of unskilled convict labourers under British colonial rule – to a new wave of tradespeople and skilled craftsmen.

Earning the nickname "diggers", these new immigrants, who worked side-by-side with Australian migrants in the gold fields, developed a strong bond of equality. This solidarity was core to the Australian concept of "mateship".

What the government had feared in 1841 had in fact started taking place with this 1851 gold rush. The government tried to entice workers back to factories, farms and markets by increasing wages and allowing the workers to unionize. This did not sway the new mates' attitudes, as mining exploration was potentially more lucrative.

The government – seeing workers leave well-paying jobs to prospect for gold – attempted to increase their political finances by introducing a large monthly licensing fee for miners. In Victoria, for example, this fee was 30 shillings (approximately \$1,400 CAD in today's dollars). That amount for a prospector in the mid-1800's was impossible to pay.

In 1854 miners in the town of Ballarat in Victoria staged a protest at the Eureka Stockade. On December 3 of that year, government troops attacked the stockade where the miner-protesters were gathered, resulting in 22 deaths.

What became known as the Battle of the Eureka Stockade solidified the public's support for miners and workers, and the Australian government had no choice but to become more socially conscious in their politics and policies. This in turn led to better working conditions nationally, including the first-ever institution of an eight-hour workday.



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